SERIAL NO.: 10/612,724

1/4

REPLACEMENT SHEET

TRANSFORM SPARSE ARRAY MATRIX CODE TO PERFORM
RUN TIME DEPENDENCY CHECK

120

SOFTWARE-PIPELINE THE TRANSFORMED SPARSE ARRAY MATRIX CODE

Fig. 1

200 510 COMPUTE A PREDETERMINED NUMBER OF VARIABLES BASED ON A VIRTUAL UNROLLING FACTOR M <u>5</u>50 INITIALIZE THE COMPUTED PREDETERMINED NUMBER OF VARIABLES BY COMPUTING VARIABLES b0, b1, ...bM-1 AND a0, a1, ...aM-1 AND INITIALIZING 60, 61, ...6M-1 TO AN ILLEGAL VALUE FOR THE b ARRAY, SAY TO -1 230 LOAD PRIOR COMPUTED VALUES SUCH THAT b[i] IS LOADED INTO THE VARIABLE BM AND THE VALUE OF c[i] IS LOADED INTO THE VARIABLE cM 240 ASSIGN THE PRIOR COMPUTED VALUES, INSIDE THE LOOP BODY, TO A PREDETERMINED NUMBER OF REGISTERS

Fig.2

SERIAL NO.: 10/612,724

2/4

300 310 UNPIPELINED (17 CYCLES PER ITERATION) TIME - > 0123456789012345678901234567890123456788901234567890123456789 ITER01: L-----S ITER02: ITER03: ITER04: UNROLLED (9 CYLES PER ITERATION) 0123456789012345678901234567890123456788901234567890123456789 TIME > ITER01: L-----S ITER02: L----S L-----S ITER03: ITER04: L-----S L-----S ITER05: L-----S ITER06: SOFTWARE PIPELINED (5 CYLES PER ITERATION) 0123456789012345678901234567890123456788901234567890123456789 TIME-> ITER01: L-----S ITER02: L-----S L-----S ITER03: ITER04: L----S ITER05: L-----S

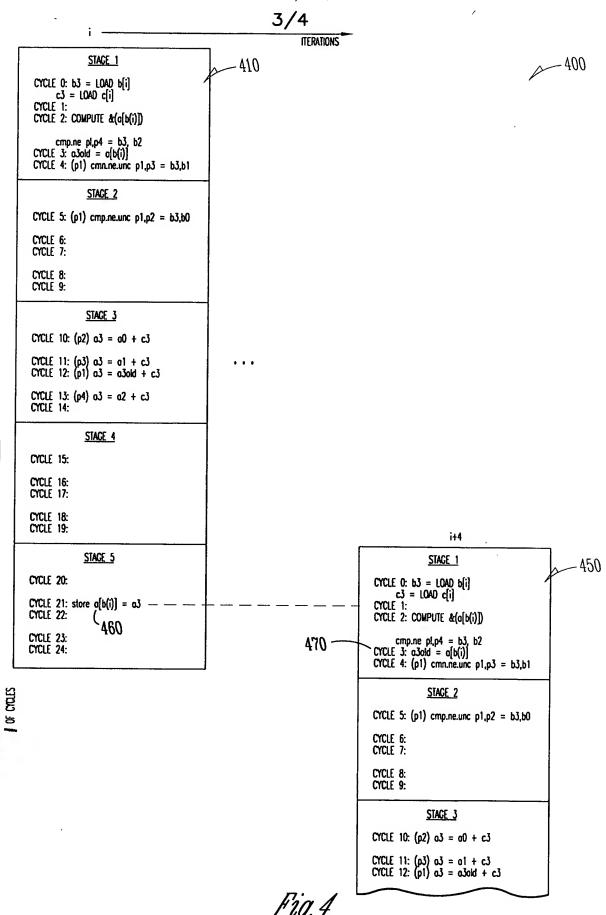
Fig. 3

L-----S

ITER06:

TITLE: SYSTEM AND METHOD FOR SOFTWARE-PIPELINING OF LOOPS WITH SPARSE MATRIX ROUTINES INVENTOR NAME: Kalyan Muthukumar et al.

SERIAL NO.: 10/612,724



SERIAL NO.: 10/612,724

4/4

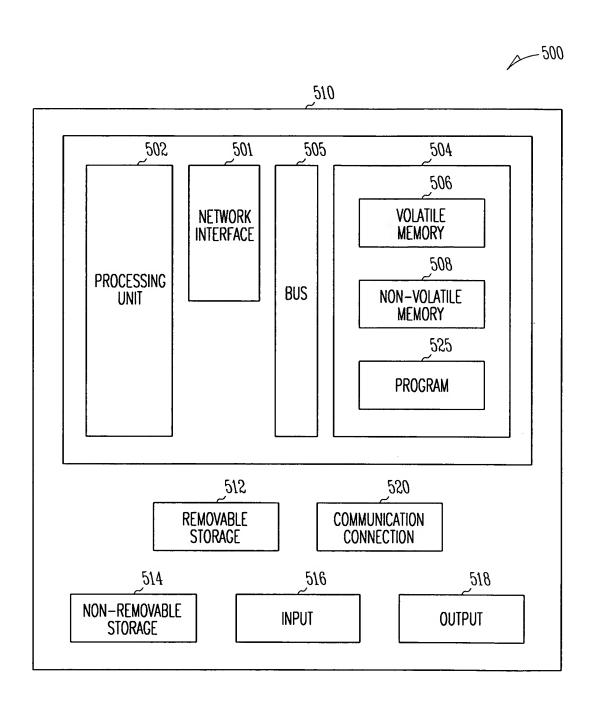


Fig.5